

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Mitigation of Orbital Debris in the)	IB Docket No. 18-313
New Space Age)	

REPLY COMMENTS OF ASTRANIS SPACE TECHNOLOGIES CORP.

Astranis Space Technologies Corp. (“Astranis”) submits these reply comments on the Federal Communications Commission (“FCC” or “Commission”) notice of proposed rulemaking (“NPRM”) seeking to adopt new rules governing orbital debris mitigation for geostationary satellite orbit (“GSO”) and non-geostationary satellite orbit (“NGSO”) systems.¹

Astranis is a new manufacturer of small GSO satellites, bringing solutions to the global telecommunications industry consistent with current best practices and the latest technological developments.² Astranis is building the next generation of smaller, lower-cost telecommunications satellites to bridge the digital divide in remote and underserved areas of the world. Indeed, Astranis’ first commercial initiative is to make broadband satellite connectivity available to unconnected areas of rural Alaska.³

Like the many other commenters in this proceeding, Astranis welcomes the Commission’s efforts to address the issue of orbital debris, which is a growing concern for all actors in the space and satellite industry, particularly given the recent and rapid proliferation of NGSO satellites. Astranis appreciates the opportunity to provide input on the important issues under consideration in this proceeding.

¹ See *Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rulemaking, FCC 18-159, IB Docket No. 18-313 (rel. Nov. 19, 2018) (the “NPRM”).

² For more information on Astranis, see <https://www.astranis.com>.

³ See <https://spacenews.com/astranis-lands-anchor-customer-for-its-first-small-geo-satellite/>.

In particular, Astranis would like to highlight the following points: (i) the Commission should not unnecessarily alter well-settled GSO orbital debris and satellite end-of-life approaches; (ii) the Commission should not regulate the design of satellites; (iii) the Commission should not unduly focus on “single point of failure” issues when considering GSO satellite license extensions; and (iv) the Commission should work with other U.S. government agencies to create a holistic and cohesive regulatory environment that will facilitate U.S. leadership in the global space and satellite industries.

I. DISCUSSION

Astranis welcomes the Commission’s efforts to address orbital debris and related issues in this proceeding. A safe orbital environment is essential for satellite operators and all participants in the space industry. It means a sustainable operational environment for the next generation, the preservation of orbital resources, and the ability to provide uninterrupted services in furtherance of the Commission’s public interest objectives.

Although orbital debris issues associated with the proliferation of NGSO satellites and constellations clearly must be addressed, effective orbital debris principles for GSO satellites are well-settled, are subject to international agreement, and have served the U.S. satellite industry well for many years. Thus, the Commission should ensure that any material changes to its orbital debris, satellite end-of-life and related rules are narrowly tailored to address the new and unmet concerns raised by NGSO satellites rather than applying new rules to GSO satellites that are already adequately regulated.

A. The Commission Should Not Unnecessarily Alter Well-Settled GSO Satellite Requirements

A large majority of the NPRM appears driven by orbital debris and satellite end-of-life concerns applicable to NGSO satellites.⁴ It also plainly includes GSO satellite considerations,⁵ as well as issues applicable to both GSO and NGSO satellites.⁶ However, some areas of the NPRM are not specific as to which type of satellite they address.⁷ Furthermore, many of the commenters in the proceeding are NGSO system proponents that understandably focus on the NGSO issues raised in the proceeding, but their comments may not so specify.

The Commission should be careful to limit proposals aimed at NGSO satellites to that sector of the industry and, indeed, distinguish between large NGSO constellations and cubesats given their disparate operational characteristics. In this context, it is important to recognize that orbital debris mitigation and satellite end-of-life issues are well-settled in the GSO context, including being subject to international agreement in the context of Inter-Agency Space Debris Coordination Committee (“IADC”) Guidelines, and should not be modified unless essential to address specific gaps that cannot be addressed through individual application review, industry practice, or other collaborative means.

B. The Commission Should Not Regulate Satellite Design

In the NPRM, the Commission has suggested that one way of tackling the orbital debris problem “would be for the Commission to regulate how satellites or satellite systems are

⁴ See NPRM at ¶¶1-2; *see also* NPRM at Sections III.C.1 (Collision Risk), III.C.2 (Orbit Selection), III.C.3 (Tracking and Data Sharing), III.C.4 (Maneuverability), III.C.5 (Multi-Satellite Deployments), III.C.6 (Design Reliability), III.F.2 (Maintaining Ephemeris Data).

⁵ See *id.* at Sections III.D.4 (Part 25 GSO Satellite Licensing Term Extensions), and III.G (Liability Issues and Economic Incentives).

⁶ See *id.* at Section III.D.1 (Probability of Success of Disposal Method).

⁷ See *id.* at Section III.I (Regulatory Impact Analysis).

designed.”⁸ Like many other commenters, Astranis does not support such an approach.

For example, Maxar Technologies, Inc., states that “the FCC should remain technology agnostic and decline to impose specific technical requirements or mandate the use of certain technologies or software when other means are available to fulfill public policy objectives.”⁹ Boeing warns that “any effort to place the commercial satellite manufacturing industry under government control would stifle innovation and growth....at least in the United States.”¹⁰

Astranis agrees and believes that the Commission should not mandate specific design or implementation requirements. Rather, as suggested by Eutelsat, the Commission could “set performance objectives but not the specific means to reach these objectives.”¹¹ The commercial space industry is rapidly innovating, and prescriptive regulation would almost certainly have a chilling effect and limit the use of new technologies, designs, and approaches. Further, any such micromanagement in regulating satellite design would have little impact upon orbital debris but may well prevent innovation and undermine U.S. leadership in the space industry.

The GSO satellite industry in particular is characterized by much a small number of sophisticated spacecraft that are designed and manufactured with control and propulsion functionality to ensure reliable operation throughout the mission period and, consistent with international requirements, transition to the graveyard orbit above the GSO arc. In this case, market forces (including manufacturer and operator commercial objectives) and well-settled international requirements are sufficient to drive reliable design elements.

C. The Commission Should Not Unduly Focus on Single Point of Failure Issues

⁸ See *id.* at ¶93.

⁹ See Comments of Maxar Technologies Inc., IB Docket No. 18-313 (filed April 5, 2019) at 12.

¹⁰ See Comments of The Boeing Company, IB Docket No. 18-313 (filed April 5, 2019) at 39.

¹¹ See Comments of Eutelsat, S.A., IB Docket No. 18-313 (filed April 5, 2019) at 6.

in GSO Satellite License Extension Requests

In the NPRM, the Commission suggests codifying a requirement to provide certain information in the context of GSO satellite license extension requests, including: “a statement that the satellite has no single point of failure that would affect its ability to complete end-of-life procedures as planned.”¹² Astranis is concerned that the concept of “no single point of failure” may be unduly limiting, may result in unwarranted denials of license extensions, and may undermine appropriate evaluation of a satellite’s reliability and operational capabilities. Other commenters agree with this view.

Intelsat opposes the single point of failure requirement “because such a certification is unnecessarily overbroad.”¹³ Indeed, a strict interpretation of this requirement could result in an authorized satellite that has additional operational lifetime being denied an extension by the Commission if there is any component that could be construed as a single point of failure (*e.g.*, a tube or valve leading to redundant subsystems), even if this design element has always been present on the satellite.

In its comments, Sirius XM Radio Inc. warns that “the Commission must use caution when codifying the information that GSO licensees must provide in connection with such a request. In particular, the FCC should avoid wording like ‘single point of failure’ and ‘fully functional’ in limiting its consideration of extension requests. A simple loss of redundancy should not be the sole basis for a decision to deny a license extension for an otherwise healthy satellite.”¹⁴ Astranis agrees and, as noted above, there is a concern with some of these concepts even without an intervening loss of redundancy.

¹² See NPRM at ¶63.

¹³ See Comments of Intelsat License LLC, IB Docket No. 18-313 (filed April 5, 2019) at 9.

¹⁴ See Comments of Sirius XM Radio Inc., IB Docket No. 18-313 (filed April 5, 2019) at 3-4.

According to AT&T, “[t]he existence of a single point of failure does not necessarily indicate that a satellite will fail either while in orbit or in the process of deorbiting, or even that there is a reasonable probability of such a failure. Indeed, given the reliability of redundant component parts, in many cases it is highly probable that a satellite with a single point of failure will operate exactly as designed for the remainder of its useful life and will be successfully deorbited. Accordingly, the Commission should avoid creating any sort of automatic limitation on license extensions based on a mandatory certification related to single points of failure....The FCC should continue to evaluate such showings on a case-by-case basis.”¹⁵

The presence or absence of a single point of failure is not an accurate measure of satellite reliability or determinative with respect to the public interest benefits associated with continued operation of a satellite. Astranis requests that the Commission assess license extension requests individually on a case-by-case basis rather than strictly applying a set of prescriptive requirements to all applications.

D. The Commission Should Cooperate with Other Agencies to Create a Holistic Space Policy

Several commenters have noted that the Commission is not the only U.S. government agency implicated in shaping space and satellite policy.¹⁶ Indeed, the U.S. Department of Commerce confirms that orbital debris mitigation will be addressed, with the participation of the Commission, in connection with their larger space policy mandate “to ensure the development of a revised regulatory framework that prioritizes responsible U.S. investment and operation in space.”¹⁷ Additionally, the Department of Commerce requested:

¹⁵ See Comments of AT&T Services, Inc. (“AT&T”), on behalf of DIRECTV Enterprises LLC (“DIRECTV”) and its other affiliates, IB Docket 18-113 (filed April 5, 2019) at 3.

¹⁶ See Comments of the Satellite Industry Association, IB Docket No. 18-313 (filed April 5, 2019) at 2.

¹⁷ See Comments of U.S. Department of Commerce, IB Docket No. 18-313 (filed April 5, 2019) at 5.

... that the Commission defer action in this proceeding until completion of the agency actions mandated by the President’s Space Policy Directives. In the interim, the Department requests the Commission’s participation in an Interagency Working Group on Commercial Orbital Debris Requirements to, among other things, identify the proper agency to administer orbital debris regulations, develop regulatory parameters for any such regulations, and identify what approach the administration should take with regard to space insurance to advance U.S. space commerce.¹⁸

The interagency approach noted by the Department of Commerce will promote the development of a comprehensive U.S. space policy across a range of manufacturing, launch and operational issues, thereby facilitating a more stable and sustainable space environment. At a minimum, such dialogue would assist the Commission in making the public interest determinations that are essential to this rulemaking.

Astranis welcomes this collaborative effort and the emphasis on spurring “investment and innovation” while encouraging “responsible space operations.”¹⁹ In particular, Astranis welcomes an interagency process, with industry input, that creates a holistic space policy and provides manufacturers, launch providers and operators with a regulatory environment that will facilitate growth, innovation and U.S. leadership in space and satellite technology.

II. CONCLUSION

Astranis appreciates the Commission’s focus on orbital debris mitigation issues, particularly in the context of a burgeoning NGSO satellite industry ranging from large NGSO broadband constellations to large numbers of NGSO cubesats. The rapid pace of change and extensive activity in this area has a direct impact on the operational environment for all space industry participants.

Given the more limited operations of GSO satellites, governed by well-settled

¹⁸ *See id.* at 3.

¹⁹ *See id.* at 17.

international regulations, industry best practices, and related requirements, Astranis believes that any modification of longstanding GSO satellite requirements should be driven by specific needs and not simply as an extension of efforts to address new and different challenges associated with NGSO systems. Astranis respectfully suggests that the Commission: (i) should not unnecessarily alter internationally accepted GSO orbital debris and satellite end-of-life approaches (ii) should not prohibit or mandate the implementation of specific satellite design elements; (iii) should not decide GSO satellite license extension requests based on the existence of a single point of failure; and (iv) should cooperate with other agencies to develop a comprehensive, integrated space policy to foster industry growth and maintain U.S. leadership in this critical area.

Respectfully submitted,

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